

REMARKS

Claims 7 and 17. The undersigned thanks the Examiner for pointing out (Office Action paragraph 1) the typographical errors in claims 7 and 17. Claims 7 and 17 have been amended to correct the typographical errors.

Art rejections. The Examiner rejects claim 1 over a three-way combination of US Pat. No. 3,921,201 to Eisele et al. (“Eisele”), US Pat. No. 4,604,538 to Merrill et al. (“Merrill”), and US Pat. No. 6,327,407 to Mitsuda et al. (“Mitsuda”).

Claim 1 is:

A rectifier assembly comprising:

a plurality of semiconductor diodes, each diode having an axis defined by an anode and a cathode;

the diodes disposed in an axial linear array;

each two axially adjacent diodes electrically and mechanically connected to each other by a metal plate, each of the diodes connected to the metal plate by solder material, each such connection using a full diode end surface;

the metal plates fixed in relative position by a mounting block;

each diode exposed to surrounding fluid except at its end surfaces.

In the rejection of claim 1, the Examiner relies heavily upon Eisele as supposedly providing all or nearly all of the limitations of claim 1. As such, a brief discussion of Eisele is in order.

Eisele shows a rectifier assembly for example in Figs. 2A, 2b, and 2c. In this rectifier assembly, there are diodes 1', 2', and so on up to 12'. In Fig. 2B is seen that these twelve rectifiers are disposed in a rectangular array, with a top row of diodes 1', 7', 3', 9', 5', and 11', and a bottom row of diodes 2', 8', 4', 10', 6', and 12'. Each diode has an axis defined by an anode and a cathode, and each such axis, in Fig. 2b, is vertical in the figure. Diodes 1' and 2' are coaxial with each other, but are not coaxial with any of the other ten diodes. Diodes 7' and 8' are coaxial with each other, but are not coaxial with any of the

other ten diodes. The same obtains for third, fourth, fifth, and sixth pairs of diodes making up the array.

The Examiner is of the view that the certain of the limitations of claim 1 may be found in Eisele. For example the Examiner, looking for the “metal plate” of claim 1, chooses to find this in item 29 of Fig. 2c of Eisele, termed a “side wall”. Yet so far as the undersigned can discern, Eisele never says the side wall is “metal”. Nor does Eisele say (so far as the undersigned can discern) that the side wall is “electrically” connected with the diodes. Indeed to the undersigned it appears from Eisele that one would never want the side wall 29 to be connected with the diodes.

The Examiner is invited to explain how the side walls 29 are somehow both electrically and mechanically connected with the diodes, or in the alternative to withdraw the rejection.

The claim also recites that “metal plates” (in the plural) are “fixed in relative position by a mounting block”. The Examiner is invited to explain what item in Eisele somehow counts as a “mounting block” and where the (plurality of) metal plates may be found, and where in Eisele it is said that the metal plates are somehow “fixed in relative position” by that block, or in the alternative to withdraw the rejection.

Claim 2 is:

The rectifier assembly of claim 1 wherein each two adjacent diodes are connected anode-to-cathode, whereby the assembly comprises a two-terminal high-voltage rectifier.

The citation of Eisele seems inapt with respect to claim 2.

On the one hand, if the Examiner chooses to ignore ten of the diodes of Eisele, and to focus solely upon two of them (such as 1' and 2'), then the two diodes focused upon never do comprise a two-terminal high-voltage rectifier. The reason, of course, is that if a high voltage needing to be rectified were to be applied to the extreme two terminals of the stack of diodes 1' and 2', the other ten diodes cannot be ignored, and they would conduct current, likely being thermally destroyed.

If on the other hand the Examiner chooses to include most or all of the diodes of Eisele in the

discussion, then the assembly departs drastically from a two-terminal high-voltage rectifier, and instead constitutes a five-terminal three-phase rectifier.

On November 21, 2005, the undersigned asked the Examiner where in the Office Action this limitation could be found. The Examiner, in an interview summary faxed November 22, 2005, stated that this limitation was supposedly discussed in the Office Action at page 3, lines 1-3. But lines 1-3 say the opposite, namely that the reference provides a “three-phase bridge rectifier”, not a “two-terminal” rectifier. (A three-phase bridge rectifier, by definition, has a minimum of five terminals.)

Reconsideration is requested.

Claim 5 is:

The rectifier assembly of claim 1 wherein the number of diodes is a multiple of six, and wherein interconnections are provided with the metal plates, whereby the assembly comprises a three-phase bridge rectifier.

If the Examiner were to attempt to read the limitations of claim 5 upon Eisele, then the Examiner has no choice but to count at least six diodes from Eisele in the reading. But then the six diodes (or twelve, if the Examiner chooses to count all twelve as a multiple of six) fail to be in an axial array as required by claim 1. Indeed Eisele actively teaches away from disposing all of the diodes in a single axial array, and instead teaches this complicated two-dimensional array in which each two diodes are in an axial array with each other but are not in an axial array with the other diodes.

Reconsideration is requested.

Claim 7 is:

The rectifier assembly of claim 6 wherein the high temperature solder material has a melt point greater than 275 degrees C.

The Examiner has apparently cited Mitsuda in connection with claim 7 because at column 21, line 17, it mentions a temperature of “as high as” 270 degrees C. It is respectfully pointed out that as such, Mitsuda fails to disclose the temperature set forth in claim 7, and indeed teaches away from it by discussing only lower temperatures. Reconsideration of the rejection of claim 7 is requested.

Claim 10 is:

The rectifier assembly of claim 1 wherein each diode defines a respective plane perpendicular to its axis, and wherein for each diode of the assembly, no other diode of the assembly lies within its respective plane.

This claim is an important one. It did not appear to the undersigned that this claim had been examined properly, and this prompted the undersigned to telephone the Examiner on November 21, 2005 to ask where in the Office Action this limitation could be found to have been discussed. In the November 22, 2005 interview summary, the Examiner stated that this limitation of claim 10 was discussed in the Office Action at page 3, line 3.

In case it may be helpful in visualizing the meaning of the words of claim 10, the Examiner is invited to look at application Figs. 7a, 7b, and 7c. The diodes 40 are in axial array (see claim 1) and no diode is in the (perpendicular to the axis) plane of any other diode.

In contrast the structure to which the Examiner appeals, namely the structure of Eisele Figs. 2b and 2c, is a structure in which there are myriad violations of the limitation of claim 10. Look, for example, at diode 9' in Eisele Fig. 2b. It has an axis that is vertical in Fig. 2b and is vertical in Fig. 2c. The plane defined as perpendicular to that axis, for diode 9', is a plane extending to the left and right in Fig. 2B, passing straight through all of the other top-row diodes 1', 7', 3', 5', and 11'.

Similarly, look, for example, at diode 10' in Eisele Fig. 2b. It has an axis that is vertical in Fig. 2b and is vertical in Fig. 2c. The plane defined as perpendicular to that axis, for diode 10', is a plane extending to the left and right in Fig. 2B, passing straight through all of the other bottom-row diodes 2', 8', 4', 6', and 12'.

Eisele aggressively teaches away from the limitation of claim 10, in which no diode is in the (parallel-to-axis) plane of any other diode.

Reconsideration is requested.

Claim 11 is:

A rectifier assembly comprising:

m times n semiconductor diodes, each diode having an axis defined by an anode and a cathode, n being at least two;

the diodes disposed in n axial parallel linear arrays of m diodes;

each two axially adjacent diodes electrically and mechanically connected to each other by a metal plate, each of the diodes connected to the metal plate by high-temperature solder material, each such connection using a full diode end surface, each metal plate extending to form a part of each of the n axial arrays, each metal plate thus contacting on one face with n diodes and contacting on its other face with n diodes;

the metal plates fixed in relative position by a mounting block;

each diode exposed to surrounding fluid except at its end surfaces.

The Examiner is apparently of the view that each and every one of these limitations may be found in Eisele (or perhaps in the three-way combination of Eisele and two other references as mentioned above). The Examiner is invited to state, with respect (for example) to Eisele Fig. 2a, 2b, and 2c, which values for n and m the Examiner feels are satisfied in Eisele. For example, does the Examiner contend that for these figures of Eisele, n is 6? If so, it is requested that the Examiner state where in Eisele the metal plates can be found that each contacts on one face n diodes and contacts on the other face another n diodes. The Examiner is then asked to state, by reference numeral, where exactly to find those plates in Eisele.

Alternatively the Examiner is requested to reconsider the rejection of claim 10.

Claim 12 is:

The rectifier assembly of claim 11 wherein each two axially adjacent diodes are connected anode-to-cathode, and wherein each metal plate thus contacts on one face with anodes of diodes and contacts on its other face with cathodes of diodes, whereby the assembly comprises a two-terminal high-voltage rectifier.

The cited structure in Eisele is a five-terminal three-phase bridge rectifier. As such, it teaches away from a two-terminal rectifier. Reconsideration is requested.

Claim 17 is:

The rectifier assembly of claim ~~47~~ 16 wherein the high temperature solder material has a melt point greater than 275 degrees C.

As was discussed above in connection with claim 7, the Examiner has apparently cited Mitsuda in connection with claim 17 because at column 21, line 17, it mentions a temperature of “as high as” 270 degrees C. It is respectfully pointed out that as such, Mitsuda fails to disclose the temperature set forth in claim 17, and indeed teaches away from it by discussing only lower temperatures. Reconsideration of the rejection of claim 17 is requested.

Claim 20 is:

The rectifier assembly of claim 11 wherein each diode defines a respective plane perpendicular to its axis, and wherein for each diode of the assembly, n-1 other diodes of the assembly lie within its respective plane.

Again the Examiner is requested to state which value of n is supposedly found in Eisele Figs. 2a, 2b, and 2c. If the value for n selected by the Examiner is six, then the examiner is asked to show where in Eisele the metal plates can be found which connect to n diodes on one face and another n diodes on the other face, or in the alternative to withdraw the rejection.

Claim 21 is:

The rectifier assembly of claim 11 wherein n is two.

Does the Examiner hold the view that a value of two for n may be found in Eisele? If so, the Examiner is invited to show how this works in Eisele, or alternatively to withdraw the rejection.

Respectfully submitted,

/s/

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